

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended): A system for assisting regeneration of a particle filter integrated in an exhaust line of a motor vehicle diesel engine, the engine being associated with various units, including:

- means for admitting air into the engine;
- means for recycling exhaust gases from the engine to the inlet thereof;
- a turbocompressor-~~(S)~~;
- a particle filter including a filter medium adapted to trap particles of soot present in the exhaust gases of said engine;
- an oxidation catalytic converter on the upstream side of the particle filter in the exhaust line or combined therewith;
- a common system for feeding fuel to the cylinders of the engine, including electrical fuel injectors associated with those cylinders;
- means for adding to the fuel an additive adapted to be deposited in the bed of soot particles to reduce the combustion temperature of particles trapped in the particle filter and to propagate their combustion;
- means for acquiring information relating to various operating parameters of the engine and the units associated therewith;

- means for monitoring the operation of the air admission means, the recycling means, the turbocompressor and/or the fuel feeding system in order to monitor the operation of the engine, these means being further adapted to trigger a phase of regenerating the particle filter by combustion of the particles trapped therein by triggering a phase of multiple injections of fuel into the cylinders of the engine during their expansion phase;

wherein said filter medium of said particle filter is at least one of (i) coated-and/or and (ii) impregnated with a material capable of constituting a reserve of oxygen adapted to propagate the combustion of the soot during an operation of regenerating the particle filter,

and wherein the distribution of the various materials in the filter is non uniform and the terminal portion of the downstream region of the filter contains no material constituting a reserve of oxygen and no catalyst.

2. (Previously presented): A system according to claim 1, wherein said material is cerium oxide.

3. (Previously presented): A system according to claim 1, wherein said material is a mixed oxide of cerium and zirconium.

4. (Currently Amended): A system according to claim 1, wherein the particle filter is also at least one of (i) coated-and/or and (ii) impregnated with a catalyst encouraging the triggering of reactions tending to reduce the pollutant emissions of the engine.

5. (Currently Amended): A system according to claim 4, wherein the particle filter is also at least one of (i) coated and/or and (ii) impregnated with a catalyst encouraging the triggering of combustion of the soot.

6. (Currently Amended): A system according to claim 4, wherein said catalyst is ~~a metal from group VIII such as platinum, palladium, or rhodium, or a mixture of such metals~~ selected from (i) metals from group VIII and (ii) mixtures of metals from group VIII.

7. (Canceled)

8. (Currently amended): A system according to claim ~~7~~ 1, wherein the material capable of constituting a reserve of oxygen is preferentially disposed in the downstream region of the inlet passages of the filter.

9. (Previously presented): A system according to claim 5, wherein the distribution of the various materials in the filter is non-uniform, and wherein the catalyst encouraging the triggering of the combustion of the soot is preferentially disposed in the upstream region of the inlet passages of the filter.

10. (Canceled)

11. (Currently Amended): A system according to claim ~~7~~1, wherein the material constituting a reserve of oxygen is preferentially disposed in the peripheral region of the cross-section of the filter.

12. (Previously presented): A system according to claim 5, wherein the distribution of the various materials in the filter is non-uniform, and wherein the catalyst encouraging the triggering of the combustion of the soot is preferentially disposed in the central region of the cross-section of the filter.

13. (New): A system according to claim 6, wherein the catalyst is selected from platinum, palladium, rhodium, and mixtures of said metals.

14. (New): A system for assisting regeneration of a particle filter integrated in an exhaust line of a motor vehicle diesel engine, the engine being associated with various units, including:

- means for admitting air into the engine;
- means for recycling exhaust gases from the engine to the inlet thereof;
- a turbocompressor;
- a particle filter including a filter medium adapted to trap particles of soot present in the exhaust gases of said engine;
- an oxidation catalytic converter on the upstream side of the particle filter in the exhaust

line or combined therewith;

- a common system for feeding fuel to the cylinders of the engine, including electrical fuel injectors associated with those cylinders;

- means for adding to the fuel an additive adapted to be deposited in the bed of soot particles to reduce the combustion temperature of particles trapped in the particle filter and to propagate their combustion;

- means for acquiring information relating to various operating parameters of the engine and the units associated therewith;

- means for monitoring the operation of the air admission means, the recycling means, the turbocompressor and/or the fuel feeding system in order to monitor the operation of the engine, these means being further adapted to trigger a phase of regenerating the particle filter by combustion of the particles trapped therein by triggering a phase of multiple injections of fuel into the cylinders of the engine during their expansion phase;

wherein said filter medium of said particle filter is at least one of (i) coated and (ii) impregnated with a material capable of constituting a reserve of oxygen adapted to propagate the combustion of the soot during an operation of regenerating the particle filter,

and wherein the distribution of the various materials in the filter is non uniform and the material constituting a reserve of oxygen is preferentially disposed in the peripheral region of the cross-section of the filter.

15. (New): A system for assisting regeneration of a particle filter integrated in an exhaust

line of a motor vehicle diesel engine, the engine being associated with various units, including:

- means for admitting air into the engine;
- means for recycling exhaust gases from the engine to the inlet thereof;
- a turbocompressor;
- a particle filter including a filter medium adapted to trap particles of soot present in the exhaust gases of said engine;
- an oxidation catalytic converter on the upstream side of the particle filter in the exhaust line or combined therewith;
- a common system for feeding fuel to the cylinders of the engine, including electrical fuel injectors associated with those cylinders;
- means for adding to the fuel an additive adapted to be deposited in the bed of soot particles to reduce the combustion temperature of particles trapped in the particle filter and to propagate their combustion;
- means for acquiring information relating to various operating parameters of the engine and the units associated therewith;
- means for monitoring the operation of the air admission means, the recycling means, the turbocompressor and/or the fuel feeding system in order to monitor the operation of the engine, these means being further adapted to trigger a phase of regenerating the particle filter by combustion of the particles trapped therein by triggering a phase of multiple injections of fuel into the cylinders of the engine during their expansion phase;

wherein said filter medium of said particle filter is at least one of (i) coated and (ii)

impregnated with a material capable of constituting a reserve of oxygen adapted to propagate the combustion of the soot during an operation of regenerating the particle filter,

wherein the particle filter is also at least one of (i) coated and (ii) impregnated with a catalyst encouraging the triggering of reactions tending to reduce the pollutant emissions of the engine,

wherein the particle filter is also at least one of (i) coated and (ii) impregnated with a catalyst encouraging the triggering of combustion of the soot,

and wherein the distribution of the various materials in the filter is non-uniform, and the catalyst encouraging the triggering of the combustion of the soot is preferentially disposed in the central region of the cross-section of the filter.

16. (New): A system according to claim 14, wherein said material is cerium oxide.

17. (New): A system according to claim 14, wherein said material is a mixed oxide of cerium and zirconium.

18. (New): A system according to claim 14, wherein the particle filter is also at least one of (i) coated and (ii) impregnated with a catalyst encouraging the triggering of reactions tending to reduce the pollutant emissions of the engine.

19. (New): A system according to claim 18, wherein the particle filter is also at least one

of (i) coated and (ii) impregnated with a catalyst encouraging the triggering of combustion of the soot.

20. (New): A system according to claim 18, wherein said catalyst is selected from (i) metals from group VIII and (ii) mixtures of metals from group VIII.

21. (New): A system according to claim 14, wherein the material capable of constituting a reserve of oxygen is preferentially disposed in the downstream region of the inlet passages of the filter.

22. (New): A system according to claim 19, wherein the distribution of the various materials in the filter is non-uniform, and wherein the catalyst encouraging the triggering of the combustion of the soot is preferentially disposed in the upstream region of the inlet passages of the filter.

23. (New): A system according to claim 20, wherein the catalyst is selected from platinum, palladium, rhodium, and mixtures of said metals.

24. (New): A system according to claim 15, wherein said material is cerium oxide.

25. (New): A system according to claim 15, wherein said material is a mixed oxide of



cerium and zirconium.

26. (New): A system according to claim 15, wherein said catalyst is selected from (i) metals from group VIII and (ii) mixtures of metals from group VIII.

27. (New): A system according to claim 15, wherein the material capable of constituting a reserve of oxygen is preferentially disposed in the downstream region of the inlet passages of the filter.

28. (New): A system according to claim 15, wherein the distribution of the various materials in the filter is non-uniform, and wherein the catalyst encouraging the triggering of the combustion of the soot is preferentially disposed in the upstream region of the inlet passages of the filter.

29. (New): A system according to claim 26, wherein the catalyst is selected from platinum, palladium, rhodium, and mixtures of said metals.